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## WEAPON DEVELOPMENT BIBLIOGRAPHY

W31 MOD 3 RETROFIT

PROGRAM DOCUMENTSDATEDOCUMENT

7-58	Stockpile to Target Sequence(STS) - See Final Development Report - W31 Mod 0 Warhead
1958	Military Characteristics, W31 - See Final Development Report - W31 Mod 0 Warhead (copy filed in Div. 5113, SRD RS5113/86/07)
12-83	Product Change Proposal - W31-2/W31-3 Retrofit, PCP 1-83 (unclassified)
11-84	Nuclear Weapon Retrofit Order W31-511, W31Y1-2/W31Y1-3 Field Retrofit (CRD)
12-85	Supplementary Weapon Development Report - W31Y1-3 (SRD RS5113/85/70)
5-86	Major Assembly Release - W31, MAR 1-86 (unclassified)

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Department of Energy review required before public release.

Name/Org: Eric Holzer / DOE-SNL Date: April 18, 2018  
Guidance (if applicable): N/A

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## WEAPON DEVELOPMENT BIBLIOGRAPHY

## W31 MOD 3 RETROFIT

CORRESPONDENCE OF HISTORICAL SIGNIFICANCE:

<u>DATE</u>	<u>ORIGINATOR</u>	<u>ADDRESSEE</u>	<u>TOPIC</u>
8-31-77	Dept of the Army	FC DNA	Request for PCP for safety improvement.(confidential)
9-29-77	DNA	PM-NUC	Minutes of pre-PCP meeting-Requests studies to improve W31 safety as the result of NWSSG and TW6S reports (unclassified)
1-22-78	Div.4325	Dept. 4320	Chronology of events relating to Army's request for W31 (and W54) PCP's.(unclassified)
9-13-78	DOE-MA	DOE-A00	MA intends to include Stockpile Modification in FY 81 budget guidance.(unclassified)
10-20-78	SNLA-4314	Dist.	Resource Allocation Document (RAD).(SFRD RS4300/2386)
12-12-78	VP 4000	Pres. SNLA	Recommends development of retrofit hardware.(SFRD RS4314-70 draft)
3-20-79	DoD-MLC	DOE-MA	W31 modification recommended and priorities established. (SRD RS5113/85/70)
10-24-80	MLC-Army member	MLC Chairman	Request for DOE cooperation in safety retrofit to W31. (SNSI RS3145-3/81/412)
6-2-81	MLC Chairman	DOE-MA	Modification to include only electrical system improvements. (SFRD RS2612/81/1833)
7-10-81	DOE-ALO	DOE-MA	Summary of ALO planning for W31. (SFRD RS3154-3/81/01401)
7-24-81	DOE-MA	MLC Chairman	Schedule information assuming FY 82 funding. (SFRD RS3154-3/81/01541)
7-30-81	DOE-MA	Dist.	SIP on hold pending resolution-whether or not to include PAL. (CRD)

9-11-81	Pres. SNLA	DOE-MA	Delays in Army staff approval cause delays in design and development. (CFRD)
10-6-81	DOE-MA	Pres. SNLA	Army calls POG to resolve problems. (CRD)
11-13-81	PM-NUC	Dist.	Summary of Oct. 21, 1981 POG. Retrofit will not include PAL. (CRD)
4-23-82	DOE-MA	DOE-ALO, SNLA and LANL	FY 82 funds for W31 not approved. (unclassified)
7-23-82	Dir. 4300	DOE-MA	Steps to minimize program slip in light of deletion of FY82 funds. (CRD)
9-9-82	DOE-ALO	DOE-MA	W31 kit production schedule. (SRD RS3154-3/82/2082)
12-30-82	DOE-ALO	DO-MA	Request for schedule guidance. (SFRD RS3154-3/83/00265)
3-15-83	DOE-MA	DOE-ALO	Requests schedule pullup without PAL incorporation. (SRD RS3154-3/00924)
5-12-83	DOE-ALO	DOE-MA	Request for resolution of PAL issue- inclusion or exclusion. (SFRD RS3154-3/83/01648)
5-23-83	DOE-MA	DoD-MLC	Include Cat D PAL but no funds available in FY84 without Congressional action. (CRD)
4-18-83	DoD-MLC	DOE-MA	Request that the Supplemental Weapon Development report be published reflecting the changes agreed to during the DRAAG meeting and that production of the W31 WH retrofit be continued (SFRD, Minutes of DRAAG meeting on W31Y1-3 Supplemental Wpn Dev Rpt (U), 1-28-86, RS3154-1/86/01543)



## WEAPON DEVELOPMENT BIBLIOGRAPHY

## W31 MOD3 RETROFIT

DEVELOPMENT TEST REPORTS:

<u>DATE</u>	<u>R-NUMBER</u>	<u>TEST CATEGORY</u>
<u>8-83</u>	<u>718103</u>	<u>Component response - shock and vibration.</u>
<p>Tests: Component response data collected to provide development criteria for new component design.</p> <p>Results: Information used as guidance for new component design.</p>		
<u>5-84</u>	<u>718104</u>	<u>Component response - thermal cycle.</u>
<p>Tests: Component response data collected to provide development criteria for new component design.</p> <p>Results: Information used as guidance for new component design.</p>		
<u>3-83</u>	<u>718105</u>	<u>Missile electrical compatibility tests.</u>
<p>Tests: Eleven functional tests were conducted using power from the missile thermal batteries to operate the transverter power supply in the MC3777 Firing Set. Tests were performed at -40 degrees F., ambient, and at +130 degrees F.</p> <p>Results: Charge time for the X-unit ranged from seconds for the eleven tests.</p>		
<u>2-84</u>	<u>718106</u>	<u>Functional test of new system to STS shock environment.</u>
<p>Test: Evaluation of the new warhead electrical system design to determine its capability to function properly after exposure to ground transport vibration.</p> <p>Results: The warhead electrical system functioned properly with no evidence of degradation after exposure to transportation and handling shocks.</p>		
<u>4-84</u>	<u>718107</u>	<u>Thermal cycle evaluation of new design to STS levels.</u>
<p>Tests: Evaluation of the new warhead electrical system design to determine its capability to function properly after exposure to thermal extremes.</p> <p>Results: The warhead system functioned properly with no evidence of degradation after exposure to thermal extremes.</p>		

Exemption 7

Exemption 7

5-84      718108      Functional test of new fusing system to a combination of temperature and launch environments.

Test: Evaluation of the new warhead electrical system design to determine its capability to function after exposure to combined temperature and launch vibration environments.

Results: The warhead electrical system functioned properly with no evidence of degradation after exposure to vibration at temperature extremes.

8-85      718110      Abnormal environment 30 calibre bullet - puncture.

Tests: Fired three shots of 30 calibre (7.62 mm, M-80 ball) through pressure cover and safety cover, carefully aimed to miss the SA112 capacitors and to penetrate the steel walls of the MC3775 power supply. The shots simulated those fired at ranges of 50 and 100 yards from a rifle. Projectile velocity ranged from 2600 to 2800 fps.

Results: All projectiles penetrated the aluminum pressure cover, the alloy steel safety cover and the outer wall of the MC3775 power supply. Considerable damage occurred to cables and a connector within the power supply. However, in no instance did the slug penetrate (or even damage) a second steel wall or either of the strong-link switches.

3-84      718115      Nike-Hercules flight test to evaluate design and function of W31-3 using prototype hardware.(surface to air)

3-84      718116      Same as above.(surface to surface)

2-85      718117      Same as 718115 except utilized early production hardware.

2-85      718118      Same as 718117.

2-85      718119      Same as 718117.

2-85      718120      Same as 718117.

Tests: Test firings were in numerical order at McGregor Range, Fort Bliss Texas. One missile was launched on March 28 and one on March 29, 1984. The last four missiles were fired on February 5, 1985. The March 29, 1984 test was in the surface-to-surface short range mode. All others were surface-to-air short range.

Results: All tests except 718117 were completely successful. For test 718117 telemetry records indicate that the warhead functions were normal up to and including charging of



the firing set X-unit. Due to a missile programming failure a final fire signal was not provided.

6-84      718121      Lightening injection test of strong link switches in new design.

Tests: An MC2935 Strong-Link Switch had all input terminals tied together and the high current pulse was injected at that point.  
Two MC2138 Environmental Sensing Devices were subjected to the same tests.

Exemption 7

Exemption 7

10-84      718122      Lightening injection test of W31-3 Warhead.

Tests: A partial warhead assembly with the an MC3079 Lightning Arrester Connector (LAC) ,a CF2710 Cable and an MC3777 Firing Set interconnected were tested. All the pins on the MC3079 LAC were tied together and the high current pulse was injected at that point.

Results: The MC3079 Lightning Arrester Connector performed as expected. It protected the internal circuits of the warhead from the high current pulse.

8-86      Environmental Test Report

Tests: The W31Y1-3 for the NH missile was tested in simulated environments normally expected to be encountered in the STS of events.

Results: Results indicated the retrofit had no adverse effects on NH performance, and the nuclear-safety improvements achieved were consistent with the intent of the new design. Use-control improvements were evaluated in testing previously reported.

WEAPON DEVELOPMENT BIBLIOGRAPHYW31 MOD 3 RETROFITMINUTES - PROJECT OFFICERS MEETINGS

<u>DATE</u>	<u>DOCUMENT</u>
6-79	Minutes - W31 Weapon Systems Improvement Group (SFRD RS3154-3/79-01830)
8-79	Minutes - W31 Weapon Systems Improvement Group (SRD RS3154-3/79-02246)
10-81	Minutes - W31 (Nike-Hercules) Executive Project Officers Meeting (SRD RS3154-3/82-00013)
2-83	Minutes - W31 POM 83-1 (SRD RS3154-3/83-00943)
11-83	Stockpile Improvement Program - Design Review (CRD)
4-84	Minutes - W31 POM 84-1 (SFRD RS3154-3/84-01773)

MINUTES - SAFETY and RELIABILITY SUB-GROUP

11-83	Minutes - Safety and Reliability Working Group 83-1 (SRD RS3154-3/84-00198)
1-84	Minutes - Safety and Reliability Working Group 84-1 (SRD RS3153-3/84-01283)

MINUTES - ELECTRICAL and MECHANICAL COMPATIBILITY SUB-GROUP

9-82	Minutes - Electrical and Mechanical Compatibility Working Group (SRD RS3154-3/82-02587)
3-83	Minutes - Electrical and Mechanical Compatibility Working Group (SRD RS3154-3/83-01592)
10-83	Minutes - Electrical and Mechanical Compatibility Working Group (SRD RS3154-3/84-00279)



MINUTES - MAINTENANCE and LOGISTICS SUB-GROUP

3-83            Minutes - Logistics Working Group Meeting  
                 (SRD RS3154-3/83-02030)

4-84            Minutes - Logistic Working Ggoup 84-1  
                 (SFRD RS3154-3/84-03062)

12-84           Minutes - Logistics Working Group 84-2  
                 (SRD RS3154-3/85-01390)

3-85            Minutes - Logistics Working Group 85-1  
                 SFRD RS3154-3/85-01748)